

NAVAIR



Supply Chain Council Award for Supply Chain Operational Excellence

**U.S. Naval Air Systems Command (NAVAIR)
Industrial Operations Group, AIR 6.0**

NAVAIR Depot Maintenance System

2002 Submission

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Section 1: General Information and Project Complexity

1) NAME OF THE SUBMITTING ORGANIZATION

U.S. Navy, Naval Air Systems Command (NAVAIR)

2) NAME OF THE ORGANIZATIONAL UNIT

NAVAIR Industrial Operations Group (AIR 6.0), Patuxent River, MD

3) BRIEF ORGANIZATION MISSION STATEMENT

The national lead for the Industrial Operations Group is the Assistant Commander for Aviation Depots. The mission statement for AIR 6.0 is as follows:

“The Mission of the Industrial Operations Group (Maintenance Team) is to maximize the material readiness of Naval air forces through management of in-service maintenance, engineering, logistics support and the performance of depot maintenance. This enables the Naval battle forces to train, deploy, fight and win with the lowest expenditure of resources.”

4) SUBMISSION AWARD CATEGORY

The NAVAIR Industrial Operations Group is applying for the Award for Supply Chain Operational Excellence, U.S. Department of Defense.

5) BRIEF DESCRIPTION OF THE SUPPLY CHAIN AND PROCESSES ENCOMPASSED BY THE NDMS PROGRAM (SCOPE)

The NAVAIR Industrial Operations Group submission has based their work to develop, implement and sustain the NAVAIR Depot Maintenance System (NDMS) across the three Naval Aviation Depots (NADEP) in: Jacksonville, FL, Cherry Point, NC, and North Island, CA. The NDMS Program delivers new remanufacturing philosophies, processes and tools that address major end item management, commodities repair, facilities management, advanced planning and scheduling, workload execution and support and specialized operations support (tool management, hazardous material management, laboratory management and inter-service workload tracking).

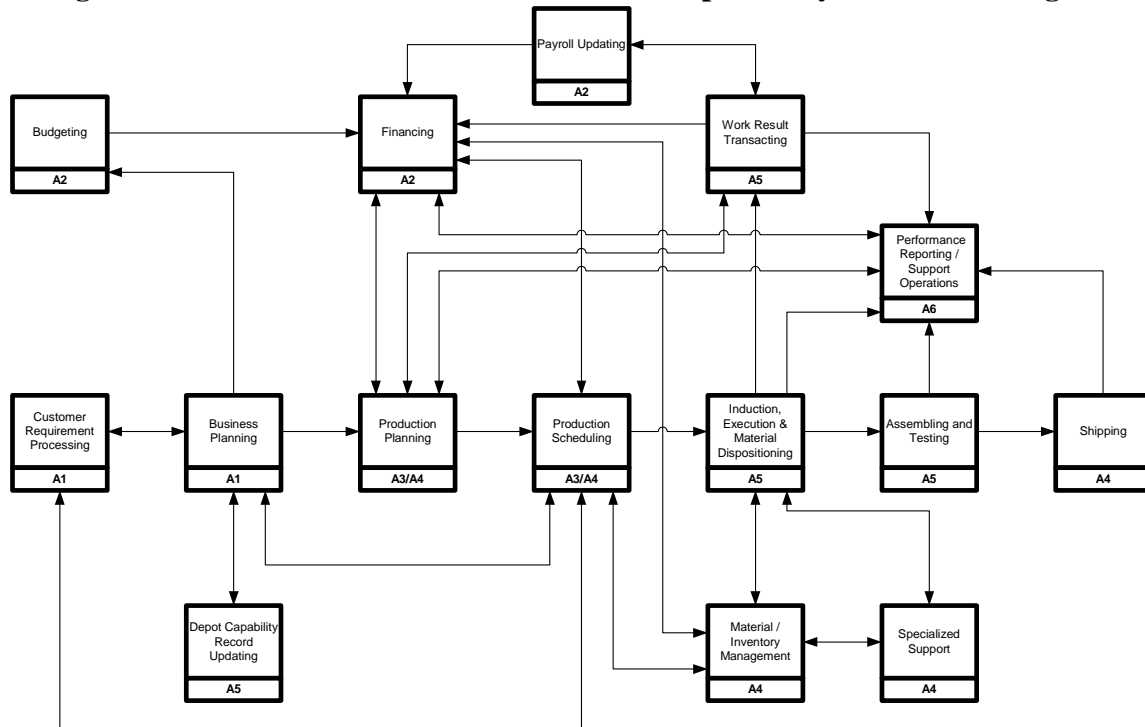
Because of the separation of Commands and missions across the Navy supply chain, a series of initiatives have been established by the U.S. Navy to provide a truly integrated and transparent supply chain management solution – each under the control of its respective Command. As identified by NAVAIR, the implementation of the NDMS suite of processes and solutions across the NADEPs provides the foundation – the crucial step – for integrating the greater Navy supply chain partners.

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From the initial identification of fleet asset repair requirements, throughout the detailed and complex repair and overhaul operations, and to the shipping of the assets back to the DoD Supply system, the NDMS Program modernizes the NADEPs processes and system infrastructure in preparation for greater supply chain integration. A key element of the NDMS Program, a commercial-off-the-shelf Manufacturing Resource Planning (MRP II) / Maintenance Repair and Overhaul (MRO) application, gives NAVAIR a highly functional platform that reduces the cycle time and cost of asset repair while delivering a stable, straight-forward solution that will tie into NAVAIR's SIGMA Enterprise Resource Planning (ERP) (covering the management of programs, finances, asset configurations, acquisition and human resources) and SMART ERP (covering the maintenance planning and management Supply material) initiatives.

The following figure, from the NDMS Level Zero Concept of Operations (CONOPS) identifies the functions that the NDMS Program provides to the NADEPs. Each of the functional activities listed below ties back to the business requirements document that bounds the NDMS Program and is performed by detailed and documented user processes.

Figure 1: Functional Business Processes Encompassed by the NDMS Program



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NDMS philosophies, processes and solutions support the SCOR Model as follows (model elements are listed in a phased manner):

Customer (NAVICP)

- **Plan:** NDMS users electronically receive a voluminous and highly variable repair forecast from the customer. The NDMS users then validate the repair capacity and capability, and electronically submit back to the Customer the supportable forecast. This communication allows NAVICP to source the repair requirement to the proper NADEP and external Original Equipment Manufacturers (OEM).

NADEPs

- **Plan:** The NDMS plans all phases of the induction, repair, and shipment of assets through the NADEP. Planning includes updating the customer on the progress of repair.
- **Source:** The NDMS provides management the information required to determine the timing and content of outsourcing and subcontracting requirements.

Supplier (NAVICP)¹

- **Source:** The NDMS accesses the Supplier system and verifies that components requiring repair are available in the Supplier's inventory.
- **Deliver:** The NDMS electronically submits an "induction schedule" to NAVICP that identifies when the NAVICP must deliver the components to the NADEP to begin repair.

NADEPs

- **Make:** The NDMS is the information management system for all NADEP repair, manufacturing, inventory and costing activities.
- **Deliver:** The NDMS manages the packaging and shipment of repaired assets to the Customer.
- **Return:** The NDMS electronically submits several different types of "return" messages to the Supply system. These "return" messages notify the Supply system that 1) an end item sent for repair is unrepairable, 2) an end item submitted for repair is missing important subcomponents (which requires Supply action) and/or 3) a part purchased through Supply is being returned to vendor.

¹ Naval Inventory Control Point is both the supplier and customer for the Naval Aviation Depots.

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Customer (NAVICP)

- **Plan:** Upon induction at the NADEP, the NDMS electronically submits the anticipated delivery date to the Customer's system. Interim progress reporting is performed to manage delivery expectation.
- **Deliver:** The NDMS delivery process includes electronically notifying the Customer's system that repaired part is being transferred back to NAVICP inventory.

The NDMS Program is used daily by over 6,500 government and contractor personnel across the three NADEPs.

6) NAMES AND NUMBER OF PEOPLE INVOLVED FROM EACH SUPPLY CHAIN PARTNER IN THE PROJECT (EXTERNAL)

Naval Inventory Control Point, Mechanicsburg, PA
Naval Inventory Control Point, Philadelphia, PA
Fleet Industrial Supply Center (FISC), North Island, CA

Approximately 50 participants from the following contracting firms support AIR 6.0's NDMS Program efforts. A lead point of contact has been identified for each major contractor listed below:

KPMG Consulting, Inc., Lexington Park, MD (15 people)

- John Dulle

Western Data Systems, Calabasas, CA (15 people)

- Mike Rappaport

LMTI, Jacksonville, FL (5 people)

- Rob Handshuh

Mitre, McLean, VA (5 people)

- Roger Woolford

Logtech, Dayton, OH (5 people)

- Cathy Cook

Veridian, Arlington, VA (2 people)

- Dean Smith

7) NAMES AND NUMBER OF PEOPLE INVOLVED FROM FUNCTIONAL ORGANIZATION AND CATEGORY OF EACH ORGANIZATION (INTERNAL)

More than 200 people, across seven NAVAIR agencies directly support the development, implementation and sustainment of the NDMS Program. A lead point of contact has been identified for each agency listed below:

NAVAIR 6.3.5, NDMS Program Management Office, Patuxent River, MD (7 people)

- CDR Jack Mills

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NAVAIR PMA 203, Patuxent River, MD (5 people)

- CAPT Tom Cahill

NADEP Cherry Point (CHPT), Cherry Point, NC (50 people)

- Col. Eugene Conti

NADEP Jacksonville (JAX), Jacksonville, FL (50 people)

- CAPT Karl Yeakel

NADEP North Island (NI), San Diego, CA (50 people)

- CAPT Pete Laszcz

Project Support Office (PSO), Cherry Point, NC (20 people)

- Ken Collins

Central Maintenance Activity (CMA), Jacksonville, FL (20 people)

- Roger Andrews

8) SUPPLY CHAIN PARTNER POINTS OF CONTACT

The NDMS Program is governed by a Functional Guidance Team (FGT), which is staffed by the Program's supply chain partners. The primary points of contact for the FGT are as follows:

Figure 2: FGT Points of Contact

Organization	Name	Telephone
AIR 6.3.5	CDR Jack Mills	(301) 757-3040
NADEP CHPT	Meg Gillikin	(252) 464-5233
NADEP JAX	Dave Dollar	(904) 542-2690
NADEP NI	Ron Snipes	(619) 545-3391

Section 2: Implementation

1) THE REASON WHY THE SUPPLY CHAIN PROJECT WAS UNDERTAKEN AND HOW IT WAS SELECTED

The current Department of Defense (DoD) maintenance logistics environment consists of over 120 independent and component-unique legacy systems/applications supporting the DoD depot maintenance business processes. These systems were developed independently by the Components to satisfy their own unique needs and contain limited capability to be interfaced with other systems outside their respective environments. The following characteristics have been attributed to the current legacy environment:

- Contains redundant storage, redundant data processing, data inconsistency, and a lack of process automation
- Uses older technologies that no longer effectively or efficiently support today's depot needs
- Does not support the evolving roles of warfighting and is inflexible
- Impairs DoD's ability to take advantage of economies of scale that exist by jointly developing systems and sharing in their operational costs.

Several factors have necessitated the push to streamline logistics processes, increase efficiency and reduce the enormous size of the DoD logistics legacy environment. These factors range from a basic change in DoD's readiness profile, to economic factors, to improvements in technology. In response, the Services have initiated several process reengineering initiatives. The four major initiatives are Lean Logistics (Air Force), Velocity Management (Army), Regional Centered Maintenance (Navy), and Precision Logistics (Marine Corps).

As part of the DoD logistics environment, the DoD Material community has an immediate need to deploy modern Automated Information Systems (AIS) to support component business process reengineering efforts with focuses on interoperability, flexibility and asset visibility. The need for an improved depot maintenance AIS is documented in the following reports and studies:

- DoD Depot Maintenance Business Vision and Strategies²
- Defense Management Review Decision (DMRD) 908 and DMRD 925
- DoD Logistics Strategic Plan, 1996/1997 Edition
- Government Accounting Office (GAO) Reports

In 1995, the DoD initiated a modernization effort to make the NADEPs more competitive with commercial organizations and to set the framework for tying the NAVAIR supply chain solutions into an integrated solution. The first phase of the modernization effort

² Joint Policy Coordinating Group (JPCG), December 1992

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centered on providing the depots with an increased capability to support repair, re-manufacturing, manufacturing, and overhaul of depot workloads, and specifically to:

- increase control over operations,
- improve productivity and throughput,
- optimize inventory levels,
- reduce operating costs,
- optimize work-in-process levels,
- increase cost visibility and control,
- improve capacity analysis and workload prioritization and
- improve depot production and scheduling responsiveness.

The team conducting the modernization effort focused on the business philosophies, policies, procedures and supporting information technologies that the NADEPs utilized to repair and maintain NAVAIR assets. After conducting an internal and external assessment, the Joint Service Feasibility Working Group submitted the *MRP II Solution Feasibility Analysis Final Report* (3 August 1995) which concluded that a Commercial-Off-The-Shelf (COTS) MRP II / MRO solution would pave the way for the operational improvements required by the modernization program. On 21 July 1995, the Deputy Under Secretary of Defense (Logistics) (DUSD(L)) approved MRP II / MRO as the overhaul/repair management migration system for the Navy.

A MRP II / MRO COTS software package was selected through a full and open competition to provide a complete, standardized and automated overhaul/repair management system. In 1996, NAVAIR purchased a MRP II / MRO COTS developed by Western Data System (WDS) named *CompassCONTRACT*®. The solution integrates all of the production variables into one system vice the traditional stovepipe stand-alone systems. *CompassCONTRACT*® forms the core solution of the NDMS Program solution suite.

The NDMS Program enhances the business processes of the depot maintenance environment in several ways:

- Allows NAVAIR depots to conduct workload planning by negotiating workload with customers, establishing structure for workload budgeting and by maintaining forecasts of workloads against business plans.
- Improves production management by planning and authorizing work, developing project and production schedules and by assigning work to specific resources.
- Improves production execution and feedback by managing resources utilization and material usage, comparison with budgets, plans and historical information.
- Supports operations by managing quality, compliance and performance.

2) PROJECT DURATION

The NDMS Program's roots go back to 1995 when the DoD established the Joint Logistics System Center (JLSC) at WPAFB, Dayton OH to modernize the DoD repair agencies through business process reengineering and "best of breed" COTS implementations. While the NADEPs were involved with the Program during the first few years, system implementations didn't commence until 1998.

NDMS implementation activities continue at NADEPs Cherry Point and North Island and have completed at NADEP JAX. Approval was granted to proceed with implementation of the NDMS to NADEPs CHPT and NI based on a successful prototype of the system at the NADEP Jacksonville Initial Operating Site (IOS). Figure 3 identifies the beginning and end date for the NADEP implementation activities.

Figure 3: Site Implementation Duration

Organization	Begin	Actual End Date	Projected End Date
NADEP CHPT	July 1998	TBD	June 2002
NADEP JAX	March 1998	September 2001	N/A
NADEP NI	November 1998	TBD	September 2002

Once a NADEP achieves the exit criteria established for Final Operational Capability, the NDMS Program moves into the sustainment phase at that NADEP.

3) THE PROCESS USED TO COMPLETE THE PROJECT

The NDMS Program followed DoD-mandated project management techniques and processes to control the cost, schedule and performance of the acquisition, development and deployment effort. The efforts can be broken up into planning, execution and control functions.

Planning

When the NDMS Program was established by the DoD, it was categorized as a ACAT 1AM program (later re-designated as ACAT III). This categorization required the NDMS Program to build a series of inter-related planning documents that defined in growing detail the requirements, scope, content, project management and deployment plan for the Program. Each of these plans would be staffed through the Program Executive Officer and a Milestone Decision Authority before the Program could proceed to the next milestone. The following table contains a list of the major planning documents developed by AIR 6.3.5's NDMS Program Management Office (PMO) to guide the NDMS effort. This list is not comprehensive.

Figure 4: NDMS Planning Documentation

DoD-Mandated Planning Documents	Non-Mandated Planning Documents
<ul style="list-style-type: none"> ■ Need Statement ■ Operational Requirements ■ Acquisition Program Baseline (APB) ■ Project Plan ■ Resource-Loaded Project Schedule 	<ul style="list-style-type: none"> ■ Change Management Plan ■ Configuration Management Plan ■ Site-Specific Training Plans ■ Data Migration Plan ■ Sunset Transition Plan ■ Concept of Operations (CONOPS) ■ Success Management Plan ■ Communication Plan ■ Information Technology Management Plan ■ Lifecycle Management Plan

Additional planning documents were generated as needed by the site implementation teams to further guide the program activities.

Execution

While Program Management is performed centrally by AIR 6.3.5, deploying the NDMS Program rests mostly with three, site-level implementation teams. These teams consist of functional and technical Subject Matter Experts from the site supported by the site's management team. The site implementation teams are responsible for following the planning guidance of the NDMS PMO as they perform detailed process reengineering and system implementation activities.

Each of the NADEPs followed the same implementation path:

- **Conference Room Pilot:** During the CRPs, the site implementation teams learned the “vanilla” NDMS solution set and then built the detailed, role-based processes that they would utilize to execute their MRO tasks via the NDMS Program.
- **Slice Implementations:** Rather than perform a one-time, “big bang” deployment of the NDMS applications and processes across the NADEP, each implementation team followed a “slice” approach. Under a “slice” approach, segments of the NADEP's business are transitioned to the NDMS Program at different times over the life of the implementation program. This approach allows the implementation team to focus their efforts, reduce the risk of failure, achieve implementation successes earlier than a “big bang” approach and perform implementation with fewer overall resources.

Control

The NDMS Program is subject to many reporting requirements from DoN and DoD agencies. No less than every quarter, the NDMS Program must submit specific and

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detailed progress reports as part of the ACAT acquisition reporting cycle. Additional “ad hoc” reporting data calls are placed on the NDMS Program on a continual basis so that DoN and DoD agencies can control the overall information management portfolio.

Internally, the NDMS PMO and NADEPs established several controlling functions and processes to manage scope, cost and performance. While there is daily communication between the implementation site teams and the PMO, the following are three very specific, planned events that are used to control the NDMS Program:

- The NDMS Functional Guidance Team (FGT) consisting of supply chain partners/stakeholders meets on a bi-monthly basis to review and solve program issues that have been elevated to the leadership team for conclusion.
- The NDMS Program reviews a monthly progress report generated from input across the Program that identifies schedule progress, issues/risks and miscellaneous program activities.
- The NDMS Program holds a bi-weekly Video Tele-Conference that is attended by the major agencies involved in the site implementations. During these VTC’s, specific site issues are discussed, lessons learned are identified and shared and interim progress reports are provided.

4) CHALLENGES

The NDMS Program has faced and overcome many challenges over the last seven years. The most serious challenges to meeting the mission and return on investment for the Program can be placed into the following three categories.

Overcoming a Competitive Past

While each of the NADEPs support the overall NAVAIR mission, their corporate pasts placed them in direct competition with each other for work and resources. While this created some minor teaming difficulties for the NDMS Program, it had a significant impact on the Program’s ability to export process improvements identified and created by one site to the other two sites. The level of distrust and/or belief in another depot’s technical/functional ability initially made it difficult to build upon lessons learned, bring the depots to consensus on major issues and deal collectively with the other members of the Navy supply chain.

To tackle this issue, the NDMS Program brought each of the NADEP implementation teams together for a five-week Gap-Fit Assessment beginning in August 2001. During the Gap-Fit Assessment, the NADEPs were required to present to each other the detailed procedures that they had developed during their CRPs. During this review, the NADEP teams discovered that over 90% of their established – highly detailed – processes were the same. They also identified first hand “best business practices” being performed at their sister NADEPs that they desired to adopt. Since this event, the NADEPs have gained a

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new respect for each other's capabilities and have worked actively to support "corporate" initiatives that will benefit all NADEPs.

Data Accuracy and Timeliness

To achieve high levels of process automation, functional efficiencies and asset visibility, the NDMS Program's solution set consists of interfaced, real-time commercial-off-the-shelf systems. While the NDMS Program has based part of its business case analysis on the benefits of its interfaced architecture, the same architecture poses challenges to realizing these benefits. Soon after implementing the NDMS Program, the NADEPs and supply chain partners discovered the disruptive effects of poor data and data that was not entered timely.

NDMS Program experienced significant confusion (and cleanup costs) when data entries made incorrectly in one application were promulgated through its other applications. Cleaning up the bad data required scouring multiple system databases and reversing multiple transactions.

The NDMS Program has also discovered that in real-time systems, data that is not entered timely can be as costly as incorrect data. Several times, transactions have "accumulated" at positions in the supply chain while work and material have physically moved through these positions (leaving the paperwork behind). The transaction backlog confuses the messages users receive from the system, delays downstream activities, "locks out" other activities from occurring and misrepresents the actual status of material.

To overcome this challenge, the NDMS Program has undertaken two activities. First, system users have been given rudimentary education on real-time, relational databases. A basic understanding of how data is shared and passed across the data architecture has caused users to be more careful and consistent in their data transactions. Second, data validation checks have been built into user-defined fields. By using data validation at the point and time of entry, incorrect data is automatically caught and corrected before it is committed into the applications.

Managing Simultaneous Implementation and Production Activities

The NADEP mission, planned and unplanned NAVAIR/DoD workload and Title 10 (10 U.S.C. 2462) limitations on non-Federal Government personnel workload for depot-level maintenance and repair requires the NADEPs to continually maintain production activities. Additionally, few commercial counterparts possess the tools, skills, capacity and/or expertise to accomplish DoD repair and overhaul work. Any halt to production, no matter how temporary, detrimentally affects Naval Aviation and interservice customers and reduces their operational mission capability. Given this backdrop, the NDMS Program had to define and execute an approach that incrementally replaced the processes and systems within the NADEPs and supply chain partners to plan, execute, manage and report repair workload without negatively impacting production levels.

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Maintaining production while implementing the NDMS Program necessitated operating the legacy Workload Control System (WCS) and performing “dual data entries” over a four year span. It also required detailed data migration, sunset, communications and information technology planning to ensure NADEP leadership and supply chain partners that all of their production concerns were identified and mitigated. While the incremental “slice” implementation reduced overall risk, it placed an extra burden on the system users and database administrators. Despite these hardships, the NDMS Program has been able to implement its processes and systems without negatively impacting production levels during the deployment phase.

5) THE METRICS USED TO MEASURE (A) PROGRESS AND (B) SUCCESS

The NDMS PMO developed the metrics in conjunction with the NADEPs and supply chain partners to measure the progress and success of the initiative’s implementation across the NDMS community.

Progress Metrics

In addition to schedule and cost variance, the NDMS Program identified, tracks and reports metrics specifically developed to monitor the progress of the implementation activities. By monitoring the metrics identified below (Figure 5) on a monthly basis, the NDMS PMO and supply chain partners receive a detailed and objective snapshot of implementation progress. The NDMS Program expects growth in all of the progress metrics each month.

Figure 5: NDMS Progress Metrics Reported January 2002

Metric	NADEP JAX	NADEP CHPT	NADEP NI
Part Numbers in NDMS	262,970	206,974	372,273
Inventory Records in NDMS	245,443	113,409	39,309
Bills of Material in NDMS	144,516	150,748	192,847
Routes in NDMS	468,814	69,516	71,881
% of Direct Labor Hours in the NDMS	100%	54%	66%
% of Workshops utilizing in the NDMS	100%	100%	98%
Inventory Accuracy	98%	89%	96%
Inventory Effectiveness	92%	77%	79%

To ensure objectivity in the progress metrics, data points are drawn directly from the NDMS application “production” (live) databases by site database administrators.

Success Metrics

While it is important to monitor the progress of NDMS implementation activities, the above metrics do not guarantee overall program success. The NDMS Program Economic

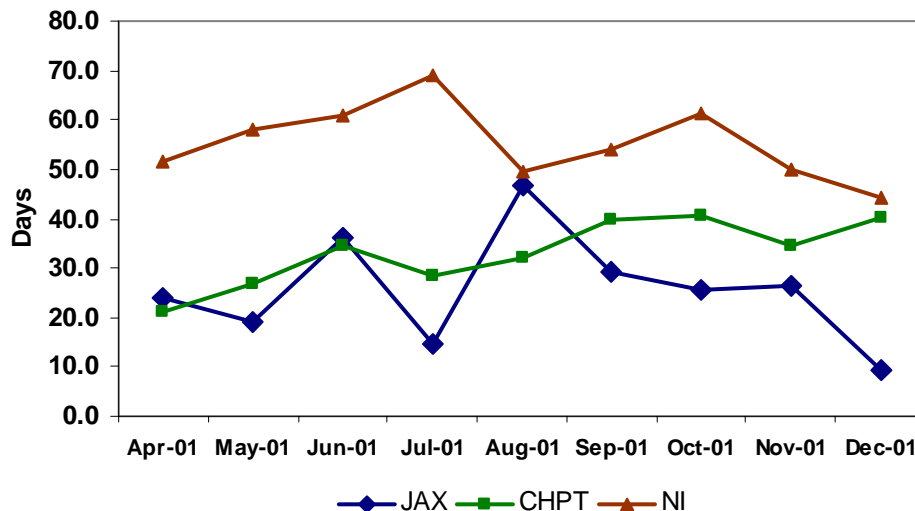
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Analysis³ objectively defines the anticipated payback and benefits of the program. To measure the success of the NDMS Program and verify if it achieves its anticipated ROI, the NDMS Program and supply chain partners defined and track a series of operational metrics. Of these operational metrics, the following metrics best reflect the impact that the NDMS Program has on the supply chain.

- **Turn-Around-Time:** Turn-around-time, in days, from inducing an end item for repair to shipping the end item to the customer.
- **Deliver to Promise Date:** Percent of time an end item is delivered on or ahead of its promise date.
- **Inventory On-Hand:** Dollar value of inventory on-hand.

Turn-around-times reported by the NADEPs reflect the “sliced” implementation paths taken by each agency. The trend line for each NADEP rises each time a new “slice” of the depot is taken live on the NDMS Program and then falls as the processes take hold. As identified earlier, only NADEP JAX has completed the deployment phase of the NDMS Program. Turn-around-times for NADEP JAX have fallen consistently since their last “slice” implementation and this reflects the expectation for all NADEPs at the conclusion of their deployment phase.

Figure 6: NDMS Program Turn-Around-Time



Mirroring the decrease in turn-around-times, the NADEPs are reporting a steady increase in their ability to deliver repaired end-items to customers on or before their originally promised due dates. Also impacted by the slice implementation approach, the confusion of the initial implementation into a new “slice” reduces the ability of the NADEPs to

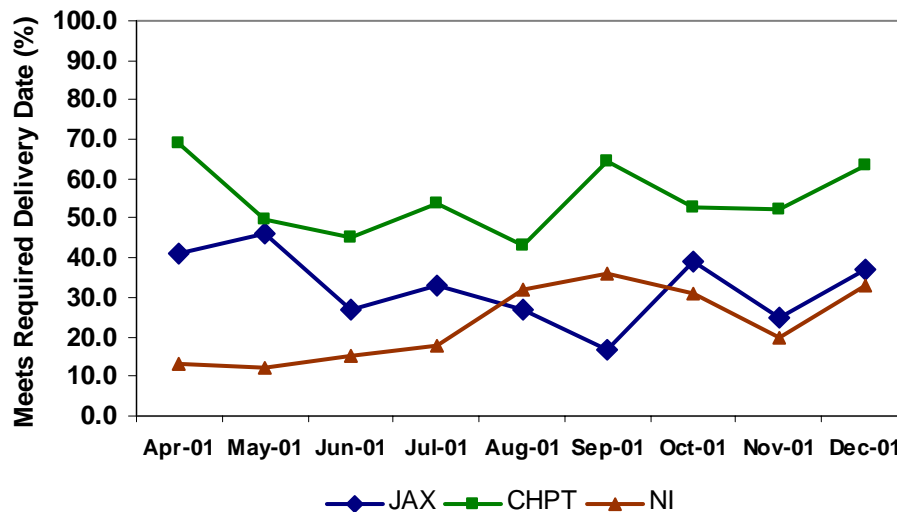
³ NAVAIR Depot Maintenance System Economic Analysis, 13 October 2000

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meet their deliver to promise dates. However, as the procedures take hold, performance improves.

It should be noted that turn-around-time reductions and increases in the ability to meet or exceed commitment due dates have an ancillary, beneficial impact on NADEP capacity: more work can be performed. This same benefit to the NADEP puts pressure on NAVICP (both as customer and supplier) to increase the availability end items for repair and the velocity with which they send these items to the NADEPs.

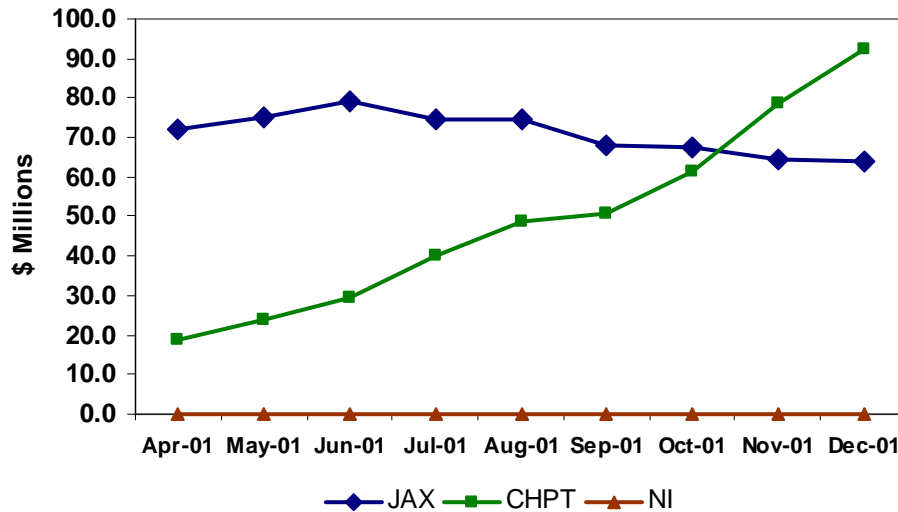
Figure 7: NDMS Program Deliver to Promise Date



The inventory on-hand metric that the NADEPs report has acted to shed a spotlight on poor supply chain practices. While NADEP and supply chain partners cringe at the story this metric shows, understanding the extent and impact of a problem is the first step to addressing it. Figure 8 indicates a steady rise in inventory dollar value at NADEP CHPT and little improvement at NADEP JAX.⁴

⁴ Note: NADEP NI carries no inventory because they have outsourced its inventory management function to the FISC. This information will be available after FISC interfaces are implemented.

Figure 8: NDMS Program Inventory On-Hand Value



After investigation, NADEPs and supply chain partners documented that the NDMS Program was properly reflecting three different types of inventory that had previously gone unrecorded: Artisan-held bench stock, inventory in active stockrooms, and inventory gained through the Base Realignment and Closure (BRAC) process. As part of the “slice” implementations, stock rooms were inventoried, informal inventory systems were discontinued and all unrecorded items were uncovered and migrated into the NDMS applications. Much of this unrecorded inventory is obsolete and the NADEPs are in the process of removing from their accounts.

6) QUANTIFIED COST AND PERFORMANCE IMPROVEMENT BENEFITS

The NDMS Program is still implementing at two of three sites. Having one foot in sustainment and one foot in deployment, the program is reporting both planned and realized costs and benefits.

Planned Benefits

The NDMS enables the NADEPs to dramatically improve depot maintenance operations and supply chain connectivity by implementing “best practice” process improvements. NDMS applications and system integration enable process improvements by providing automation tools that “lock in” the processes thereby reducing cycle time and improving operations at reduced cost. As a result, the depots will see dramatic process changes and corresponding cost reductions in depot labor, material and systems costs. Additionally, NDMS implements a systems infrastructure which provides depot managers the tools to establish and maintain corporate data and the ability to most effectively leverage this data for supply chain planning and process improvement on a continuous basis in the years ahead.

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There are two types of system and mission benefits quantified by the NDMS Program Economic Analysis:

- **Legacy Cost Savings:** Savings associated with discontinued use of legacy information systems. Legacy savings account for the costs avoided by replacing existing systems with the NDMS.
- **Functional Benefits:** Savings associated with business process improvements resulting from implementation of improved business processes addressed by the NDMS. Functional benefits are also called “Mission Benefits.” They include benefits from deploying individual NDMS processes and systems and from the integration of these processes and systems into a total solution. Functional benefits result in savings in terms of direct/indirect labor/material costs.

Savings/Cost Avoidance

The NDMS PMO developed an organization structure that leverages experts from both Functional and Technical backgrounds. Taking a more proactive and disciplined role in managing Corporate IT initiatives, these teams, the Technical Control Group and Functional Guidance Team, form an organizational framework which fosters the efficient usage of limited industrial IT resources and budgets. This management approach provides cost avoidance capabilities through streamlining depot implementation operations while supporting continual depot operations during the stages of declining maintenance budgets.

Return on Investment (ROI)/Net Present Value (NPV)

The DM System EA of April 1997 created by the Joint Logistic System Center (JLSC) projected that the return on investment (ROI) based on FY93 dollars was 4.1 to 1. NAVAIR updated the JLSC EA to incorporate system changes since Program Management Responsibility Transfer (PMRT) and updated savings are based on the results of the slice implementations to date. The NDMS Economic Analysis (EA) of July 2001 projects the return on investment (ROI) based on FY 99 dollars to be 2.75 to 1.

Realized Benefits

NADEP JAX achieved NDMS Program FOC in October 2001. During the 1st quarter of FY2002, NADEP JAX repaired over 10,000 components – beating all records for the 63 year old organization. They are on track to better that production output this current quarter.

7) HOW THE SUCCESS OF THE NDMS PROGRAM SUPPORTS ORGANIZATIONAL OBJECTIVES

The NDMS Program delivers philosophies, processes and tools that enable the Naval Aviation Depot Maintenance Team to deliver comprehensive life cycle support of Naval aviation weapon systems. By increasing NADEP capabilities, capacity and supply chain connectivity, the NDMS Program supplies increased responsiveness to customer needs,

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reduced life-cycle costs and maximized aircraft availability. The NDMS Program increases the velocity, manageability and cost effectiveness of NAVAIR's repair operations and supports Supply and the warfighter by making repaired assets available for training, deployment, fighting and winning.

Section 3: Knowledge Transfer

1) LESSONS SHARED WITH OTHER INTERNAL ORGANIZATIONS

The NDMS Program is committed to communicating and sharing programmatic information across the NADEPs, NAVAIR Command and the supply chain partners. The NDMS Corporate Solution Program Management Plan⁵ identifies the community of internal organizations that must – at a minimum – be continually updated on NDMS progress, issues and experiences.

Functional Guidance Team

The Functional Guidance Team (FGT) is an Enterprise Team, which operates under the authority of the Naval Aviation Industrial Executive Board (NAIEB). The mission of the FGT is to implement the Command-wide strategy within the Industrial Operations Competency and the Naval Aviation Depots (NADEPs). The FGT meets periodically to address program-level issues and determine program direction.

Technical Control Group

The Technical Control Group (TCG) is called upon to identify and present technical requirements for sustained applications, establish a common set of infrastructure standards for the Industrial Community, develop technical alternatives, suggest solutions to business problems and maintain configuration control of the technical baseline. The TCG works as a cohesive team with the FGT to address technical issues and helps the FGT articulate technical matters to the Industrial Business Process Leadership Team (IBP-LT) for decisions as required.

Monthly Status Report

Each month the NDMS PMO rolls up individual NADEP progress and status reports into a combined report. This combined report is then distributed to appropriate NDMS Program personnel at the NADEPs, PMO, PSO and CMA. Additionally, information from this report is transposed into other DoD and DoN required reports. The focus of the report is site status, implementation metrics and risks/issues to NDMS implementation.

Biweekly VTC

The NDMS Program conducts biweekly VTCs for the benefit of engaged personnel. This VTC is a forum for relaying information from NAVAIR Headquarters, project progress reporting and project management reviews. Minutes from this meeting are distributed to NADEP, PMO, PSO and CMA representatives.

⁵ NDMS Corporate Solution Program Management Plan, 17 November 2000

NAVAIR Depot Maintenance System

Corporate Information Technology Management Website

The NDMS PMO established a Corporate Information Technology Management (ITM) Website available on the NAVAIR intranet. Through the website, NDMS Program personnel can access the CONOPS document, project deployment information, technical architecture documentation, teaming information and other important programmatic details. The NDMS PMO provides the most current information via the Corporate ITM Website.

Figure 9: NAVAIR 6.0 ITM Website



2) TRANSFERENCE OF THE NDMS PROGRAM TO OTHER ORGANIZATIONS

Across DoD

The NADEPs make up only three of 19 DoD depots. Macroscopic depot functionality remains the same across the Army, Air Force, Navy and Marine Corps. Additionally, joint initiatives in financial, logistics and information technology systems acquisition and deployment imply the only differences in business processes will be in local depot manufacturing management applications. The MRP II / MRO solution of NDMS can help modernize and standardize DoD depot-level maintenance practices from an information systems perspective. Through the use of NDMS's MRP II / MRO solution, depots can more easily interface with DoD's Enterprise Resource Planning (ERP) initiatives.

In August 2001, the U.S. Air Force commenced a study to compare their current business requirements and processes to the NDMS Program's functionality and processes. This study is reaching its conclusion and preliminary indications from the U.S. Air Force are that the NDMS Program's MRP II / MRO solution will be installed across the Air

NAVAIR Depot Maintenance System

Logistic Centers (ALC). The U.S. Air Force has engaged NAVAIR at multiple levels to investigate the exportation of the NDMS philosophies, processes and tools to the ALCs. For weapons systems that retain three levels of maintenance, many NDMS component applications may be of use at the intermediate-level. Again, intermediate-level applications can be interfaced directly into a service ERP initiative or depot MRP II system, creating a more collaborative supply chain.

Commercial Depot-level Facilities

Surprisingly few commercial depot-level facilities possess an MRP II / MRO solution. Although many commercial companies use an MRP II or ERP system in manufacturing new products for DoD, MRO implementations are relatively new to the commercial world. Deployment of NDMS components or an NDMS-like solution facilitates the growth of true supply chain management in DoD, increases total asset visibility and enables logistics transformation on a global scale.

Foreign Military Depots

As Foreign Military Sales (FMS) progress and DoD looks for cost sharing solutions, foreign customers are committing to some depot-level repair capability. These depots do not provide the comprehensive capability of a NADEP per se. Nonetheless, MRO activities and repair standards on weapons systems components remain ubiquitous. The addition of a foreign military depot into the supply chain through NDMS components or NDMS-like applications fosters greater collaboration in allied defense readiness.

Foreign Commercial Manufacturing Activities

Weapons systems development programs such as the Joint Strike Fighter require more than allied cooperation. Synergistic collaboration in the weapons system life cycle will be not only desired, but required to ensure the system is fully mission-capable and the customers' desired level of operational readiness maintained. Deployment of NDMS Program elements to these facilities and activities provides an unprecedented asset life cycle visibility, increases manufacturing collaboration and enhances the cooperation necessary to field the desired weapons systems.